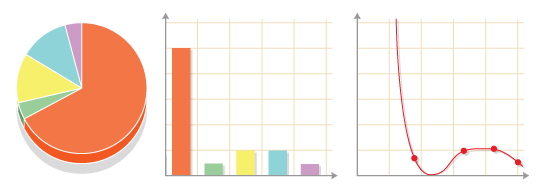
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**Graphing and Data Analysis Tutorial**

Ms. OK, PreAP Biology, 2014-2015

**A. What types of graphs can we use to represent data?**

1. Line Graph: A line graph is used to show trends in the data (usually a change in the dependent variable over time).
2. Bar Graph: A bar graph is used to compare several different values.
3. Circle / Pie Graph: A pie graph is used to show the parts of a whole.



***Types of Graphs:*** *From left… pie graph, bar graph, line graph*

**B. What must be included in a “proper scientific graph?”**

1. A title that describes the variables on both the X and Y axis. Most of the time you will be able to use the following format… “The effect of \_\_\_ on \_\_\_\_,” where the first blank is your independent variable (the factor you change in the experiment) and the second blank is your dependent variable (the factor that changes as a result of the change in the independent variable; the dependent variable is the variable you measure).
2. Labels for both your X and Y axis with units in parantheses where applicable

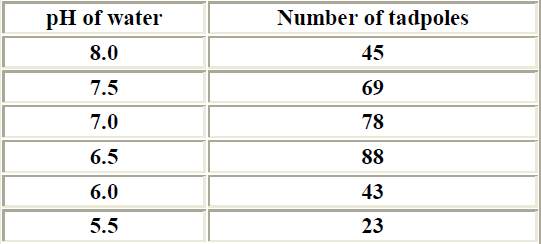
-The independent variable goes on the X axis

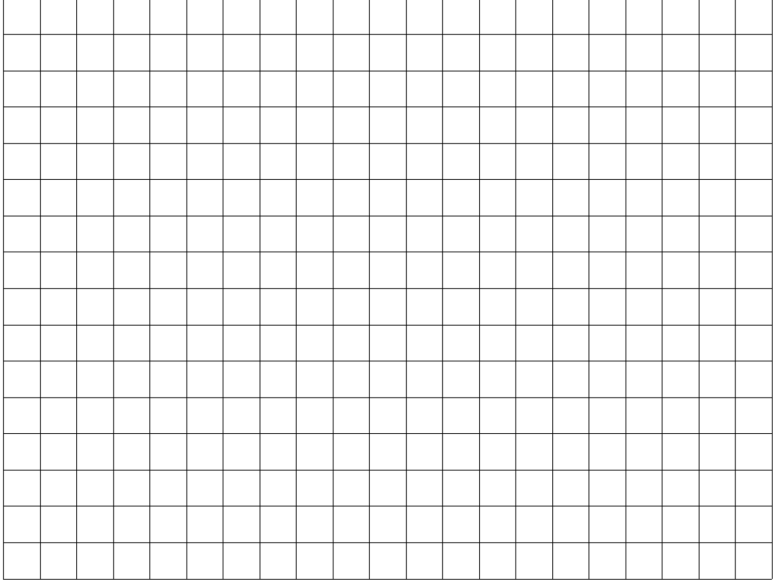
-The dependent variable goes on the Y axis

1. Appropriate scales with even intervals for your X and Y axis (Note: Your scales do not need to start at zero.)
2. Properly plotted points (for a line graph) or bars (for a bar graph)
3. A legend / key (only if multiple sets of data are plotted on the same graph)

**C. Let’s try graphing a set of data… OH HOORAY ☺**

1. Please graph the data for the problem given below:
2. **Problem:** Let’s say scientists were attempting to determine the effect of changing pH levels (a measure of acidity) in a pond on the number of surviving tadpoles. They counted the number of tadpoles found in ponds at various pH levels. Their data is given below.Please graph the data on the next page—making sure to include all the elements of a “proper scientific graph”—and answer the questions on the next page.





1. **Questions:**

-What kind of graph did you use to plot the data and why?

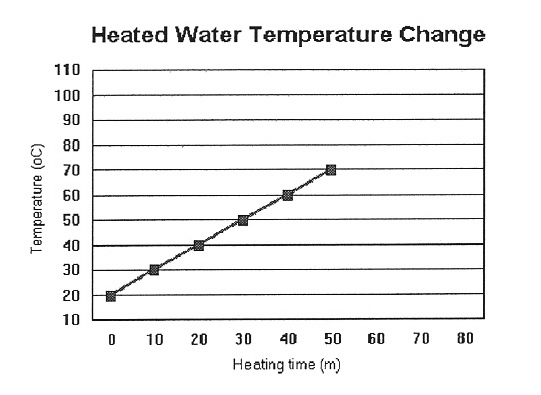
-What is the independent variable?

-What is the dependent variable?

-What is the OPTIMUM water pH for tadpole survival?

**D. If I am given a chart or graph, how should I analyze the data?**

1. Make sure to read the title and axis labels for a graph or the title and row / column headings for a chart.
2. Try to identify the independent and dependent variable.
3. Some people choose to read the question before completing steps 1 and 2, and some people choose to complete steps 1 and 2 before reading the question.
4. Some terms you may want to know…

-Maximum / optimum = the highest / best value

-Minimum = the lowest value

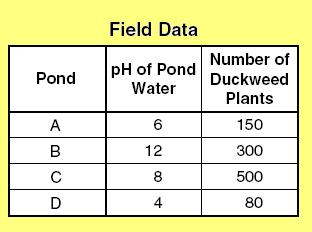
**Practice Problems**

Based on the data in the graph to the right, the temperature of water at 25 minutes is

a) 15˚F

b) 15˚C

c) 45˚F

 d) 45˚C

The information to the right was collected in the field while studying the effect of pH on the growth of the duckweed plant. The data shows that duckweed has optimum growth at a pH of —

a) 4

b) 6

c) 8

d) 12